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EQUIPMENT TO UPGRADE THE FACILITIES OF THE IIT
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CHICAGO FLUID DYNAMICS RESEARCH CENTER.

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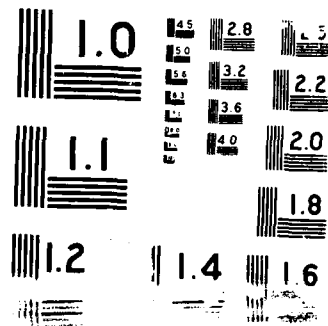
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TITLE: EQUIPMENT TO UPGRADE THE FACILITIES OF
THE FLUID DYNAMICS RESEARCH CENTER

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FINAL TECHNICAL REPORT

AFOSR Grant 87-0038

PRINCIPAL INVESTIGATOR: John L. Way

INVESTIGATORS: David Williams, Thomas Corke

Hassan Nagib and Mukund Acharya

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Illinois Institute of Technology
Mechanical and Aerospace Engineering Department
Fluid Dynamics Research Center
Chicago, Illinois

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FIELD	GROUP	SUB. GR.	Laser Doppler Anemometry; Data Acquisition; etc.		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) We are currently approaching the completion of the National Diagnostic Facility at IIT. The facility is based on a computer-controlled wind tunnel with a test section 4 ft. high, 5 ft. wide and 36 ft. long exhibiting very high quality flow conditions under both constant and oscillating free-stream velocity conditions. The funding of this facility was initiated under a 1983 DOD University Research Instrumentation Program (AFOSR-Grant-83-0339). A key aspect of the wind tunnel design is the manner in which heat energy produced by fan inefficiencies, is removed from the recirculating tunnel air. This involves the first use of turning vanes which also act as heat transfer elements. The system is sized to allow continuous operation of the wind tunnel at speeds of 250 fps, which is 2.5 times those of common university wind tunnels, and two hours of operation at the maximum tunnel velocity of 550 fps. This new and unique facility will be dedicated to basic research at near-flight Reynolds numbers, thereby, aiding in the design of the next generation of aircraft. The equipment acquired under this Grant has made many of these objectives become realities. Keywords:					
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The purpose of this grant was the acquisition of equipment to upgrade the effectiveness of some of the facilities of the Fluid Dynamics Research Center at I.I.T. Equipment expenditures were requested and made in four categories:

- (1) Scanning LDA Components
- (2) General Laboratory Electronic Equipment
- (3) Data Acquisition, Processing, and Control Workstations
- (4) System Upgrade Components

Equipment to fulfill the upgrading in these four categories has been purchased and implemented in the various laboratories of the Center. Research results obtained with this upgrade equipment have been reported at two AFOSR workshops in Colorado Springs (July, 1987) and Los Angeles (June, 1988), and several national and international technical meetings as well as in a number of M.S. and Ph.D. theses.

The equipment purchased under upgrade categories (3) and (4) deserve special mention. This equipment, along with compatible components already existing at the Center, was reconfigured into an Ethernet system consisting of four Masscomp computers and one IBM PC/XT. The reconfiguration ideally distributed the special capabilities of the Masscomp computer components, and the network makes the total capabilities of the entire system available to all the Center's laboratories.

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